ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

Data report

September 2017

Ice area export from Laptev Sea

Feb – May, 1992 - 2014

HELMHOLTZ ASSOCIATION

Authors

Thomas Krumpen **Alfred Wegener Institute**
Helmholtz Centre for
Polar and Marine Research
Bremerhaven

This work was funded by the
Federal Ministry of Education and Research
(Grant 03G0639A)

Document Version

Rev 1.0	03. September 2017	Initial Version

Important Note

Updates of the dataset will happen irregularly or upon request and revisions of the entire data time series might occur at any time. Furthermore applied additional data products may change. We stress the fact that for the interpretation of the data, associated uncertainties should be taken into account.

We encourage users to give feedback (tkrumpen@awi.de)

Introduction

Purpose of this Document

Purpose of this document is the documentation of the area flux estimates of sea ice out of the Laptev Sea published in

Itkin & Krumpen (2017), Winter sea ice export from the Laptev Sea preconditions the local summer sea ice cover and fast ice decay, The Cryosphere

Background

Satellite-based sea ice area export out of the Laptev between February and May is calculated using ice drift velocities and ice concentration information obtained at the northern (NB) and eastern boundary (EB) of the study area (Fig. 1). The NB spans a length of 700 km and is positioned at 81°N, between Komsomolets Island and 140°E. The EB with a length of 460 km, connects the eastern end of the NB with Kotelnyy Island (76.6°N, 140°E).

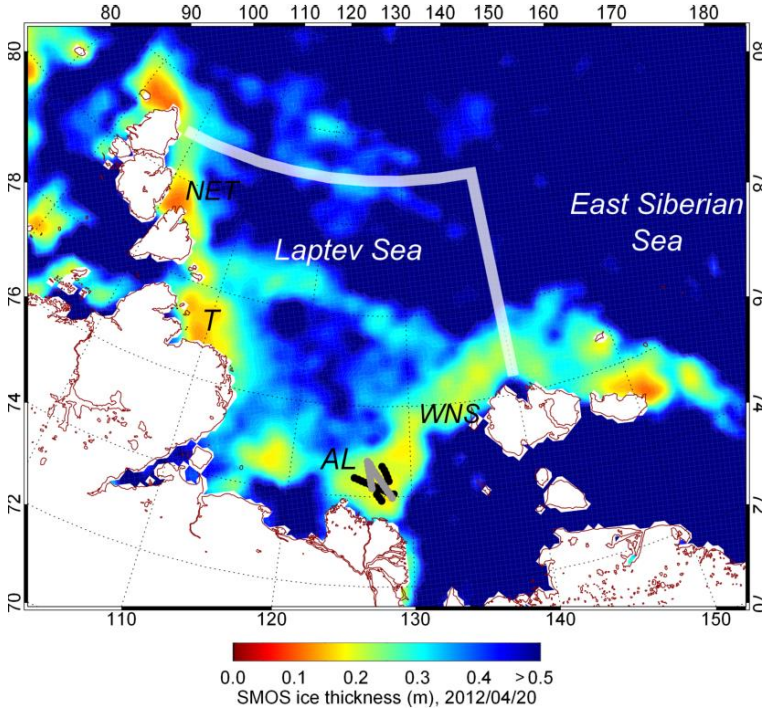

Fig: Boundaries for which area flux estimates were computed

Data

Processing

Following Krumpen et al. (2013), the sea ice flux is the sum of the NB and EB flux, which is the integral of the product between the *v* and *u* component of the ice drift and ice concentration. The volume flux is calculated in a similar way, but replacing the sea ice concentration with the sea ice thickness. Note that in Itkin & Krumpen (2017), a positive (negative) flux refers to an export out of (import into) the Laptev Sea.

Provided Data

Following information are provided in file *IceExport_Total_Feb-May_1992-2014.txt*

Parameter	Description
Year	Total flux between February and May
Sea Ice Area Flux	Sea ice area flux computed from satellite data given in km²

Applied Satellite Data

The applied ice drift and concentration data is provided by the European Space Agency (ESA) via the Center for Satellite Exploitation and Research (CERSAT) at the Institut Francais de Recherche pour d'Exploitation de la Mer (IFREMER), France. The motion fields are based on a combination of drift vectors estimated from scatterometer (SeaWinds/QuikSCAT and ASCAT/MetOp) and radiometer (Special Sensor Microwave Imager, SSM/I) data. They are available with a grid size of 62.5 km and have a temporal resolution of 3 days. The applied concentration product is provided by the same organization and is based on 85 GHz SSM/I brightness temperatures, using the ARTIST Sea Ice (ASI) algorithm. The product is available on a 12.5 km x 12.5 km grid. A comparison with ice drift information obtained from Environmental Satellite (ENVISAT) Synthetic Aperture Radar (SAR) images and long-term moorings equipped with Acoustic Doppler Current profilers (ADCP) have shown that accuracy of the of IFREMER motion data is high and the uncertainty in ice area export is around 81 x 103³ km² for the NB and 57x10³ km² for the EB over the entire winter (Oct-May).

ASCII file (.txt)*

For each year, the total sea ice flux across NB and EB in km² for the period between February and May is given.

- YYYY Year for which total sea ice flux between Feb-May is provided
- FM_area_export Area flux across NB + EB (km²)